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ONE LINCOLN CENTER			HOFFMANN, JOHN M	
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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte CARLINO PANZERA and LISA M. KAISER

Appeal 2009-014071
Application 09/460,951
Technology Center 1700

Decided: June 29, 2010

Before MICHAEL P. COLAIANNI, CATHERINE Q. TIMM, and
JEFFREY B. ROBERTSON, *Administrative Patent Judges*.

TIMM, *Administrative Patent Judge*.

DECISION ON APPEAL

I. STATEMENT OF CASE

Appellants appeal under 35 U.S.C. § 134 from the Examiner's decision to reject claims 1-4 and 6-⁷¹ under 35 U.S.C. § 103(a) as

¹ The Examiner has indicated the allowability of the subject matter of pending claim 5 (Ans. 2).

unpatentable over Weinstein (DE 1,441,336; published Apr. 22, 1971) in view of Shareef ("The effect of microstructural features on the biaxial flexural strength of leucite reinforced glass-ceramics," *Chemical Abstracts* 120 (2001)). We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

Appellants' invention relates to a two-phase, dental porcelain composition for dental restorations, inlays, onlays or veneers, which is chemically and thermally stable and provides a smooth, non-abrasive surface when applied to high expansion alloys and ceramics (Spec. 3:18-4:5). Claim 1 is illustrative:

1. A method of fabricating a dental restoration comprising:

providing a framework possessing a coefficient of thermal expansion of as high as about $18 \times 10^{-6}/^{\circ}\text{C}$; and

fusing a dental porcelain composition comprising a leucite crystallite phase dispersed in a feldspathic glass matrix to said framework to provide a smooth, non-abrasive surface thereon;

said fused dental porcelain composition having a maturing temperature in the range from about 750° to about 1050° C., a coefficient of thermal expansion (room temperature to 450° C.) of from about $12 \times 10^{-6}/^{\circ}\text{C}$. to about $17.5 \times 10^{-6}/^{\circ}\text{C}$., and comprising:

Component	Amount (wt. %)
SiO ₂	57-66
Al ₂ O ₃	7-15
K ₂ O	7-15
Na ₂ O	7-12
Li ₂ O	0.5-3

and further comprising a dispersed leucite crystallite phase representing from about 5 to about 65 weight percent of the dental porcelain, and wherein the leucite crystallites possess diameters not exceeding about 10 microns.

II. DISPOSITIVE ISSUE

The following dispositive issue arises from the contentions of Appellants and the Examiner: does the evidence support the Appellants' view that the Examiner erred in concluding that using leucite crystallites with diameters not exceeding about 10 microns would have been obvious in the dental porcelain composition taught by Weinstein based on the teachings of Weinstein and Shareef?

We answer this question in the negative.

III. ANALYSIS

We adopt the Examiner's findings in the Answer as our own and add the additional findings of fact appearing below for emphasis.

Appellants contend that the combination of Weinstein and Shareef fails to teach or suggest using leucite crystallites that do not exceed 10 microns because neither Weinstein nor Shareef expressly teaches a

crystallite size range of no greater than 10 microns (Reply Br. 2-3).

According to Appellants, neither the teaching in Weinstein of no greater than 74 microns nor the teachings in Shareef of particles “finer in size” or a reduced particle size suggests leucite crystallites with diameters not exceeding 10 microns (*id.*). We cannot agree with Appellants’ contention.

In an obviousness analysis, the proper focus is on evidence of what was known before the time of invention, and the analysis must not unduly constrain the breadth of knowledge available to one of ordinary skill in the art. *In re Translogic Tech.*, 504 F.3d 1249, 1260 (Fed. Cir. 2007). An improvement in the art is obvious if “it is likely the product not of innovation but of ordinary skill and common sense.” *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007). Optimization of a variable which is recognized in the prior art to be a result effective variable would ordinarily be within the skill in the art. *In re Boesch*, 617 F.2d 272, 276 (CCPA 1980); *see also In re Aller*, 220 F.2d 454, 456 (CCPA 1955) (“[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.”).

The Examiner’s rejection clearly admits that the references do not expressly teach using crystallites with diameters no greater than 10 microns, but relies on a different rationale from the Appellants’ for using crystallites with diameters no greater than 10 microns in establishing a *prima facie* case of obviousness (Ans. 6). Specifically, the Examiner reasons that Shareef provides evidence that one of ordinary skill in the art “would have been motivated to use as fine of sized particles as would maximize the strength of the final product” (Ans. 6). We agree, and, based on this rationale,

determine that the Examiner has established a prima facie case of obviousness.

Shareef states that “uniformity of microstructure and leucite crystal size are major factors in detg. [determining] the biaxial flexural strength of leucite reinforced glass-ceramics” (Shareef, at 1). Thus, leucite crystal size is a recognized result effective variable. Accordingly, one of ordinary skill in the art would have been able to optimize the leucite crystal size by routine experimentation to arrive at a desired flexural strength.

Appellants’ arguments fail to address the particular reasoning set forth in the Examiner’s rejection. The Examiner has provided a sound reason for the proposed combination, and Appellants have provided no persuasive evidence or argument to support finding the Examiner’s position untenable.

We find it of no moment that Shareef teaches using smaller leucite crystal sizes for a different purpose (improved flexural strength) than the purpose alleged by Appellants (improved smoothness) (*see Reply Br. 3*). “As long as some motivation or suggestion to combine the references is provided by the prior art taken as a whole, the law does not require that the references be combined for the reasons contemplated by the inventor.” *In re Beattie*, 974 F.2d 1309, 1312 (Fed. Cir. 1992).

It is true that a routine variable change sometimes causes an unexpected effect. In such a situation, the claimed subject matter will be unobvious under the law if Appellants present a showing of criticality of the range for unexpected beneficial results. *See Boesch*, 617 F.2d at 276; *Aller*, 220 F.2d at 456; *see also In re Woodruff*, 919 F.2d 1575, 1578 (Fed. Cir. 1990). On the record before us, Appellants present no convincing evidence that improved smoothness achieved using leucite crystallite with a diameter

not exceeding 10 microns is an unexpected and superior result. In fact, the record before us provides no evidence demonstrating improved smoothness, only allegations to that effect (*see* Spec. 4:26-5:4; Br. 5, second full ¶).

IV. CONCLUSION

On the record before us² and for the reasons discussed above, we sustain the rejection maintained by the Examiner.

V. DECISION

We affirm the Examiner's decision.

VI. TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED

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BOND, SCHOENECK & KING, PLLC
ONE LINCOLN CENTER
SYRACUSE, NY 13202-1355

²Only those arguments actually made by Appellants have been considered in this decision. Arguments which Appellants could have made but chose not to make have not been considered and are deemed to be waived. *See* 37 C.F.R. § 41.37(c)(1)(vii) (2008).